



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/903,059	07/10/2001	Constantin Bulucea	NS-4971US	9375

43734 7590 01/11/2006

RONALD J. MEETIN, ATTORNEY AT LAW  
210 CENTRAL AVENUE  
MOUNTAIN VIEW, CA 94043-4869

EXAMINER
----------

FARAHANI, DANA

ART UNIT	PAPER NUMBER
----------	--------------

2891

DATE MAILED: 01/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/903,059

Applicant(s)

BULUCEA, CONSTANTIN

Examiner

Dana Farahani

Art Unit

2891

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 17-130 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 38-46 and 71-122 is/are allowed.
- 6) ☒ Claim(s) 17-37 and 47-70 is/are rejected.
- 7) ☒ Claim(s) 123-130 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's arguments filed on 10/7/05 are considered and are persuasive. Accordingly, the previous requirement for restriction is withdrawn.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3. Claims 17-21, 23-30, 53, 61, 69 and 70 are rejected under 35 U.S.C. 102(a) as being anticipated by Applicant's Admitted Prior Art (AAPA).

Regarding claims 17, 18, 21, 23-27, 30, 53, 61, 69, and 70, AAPA discloses in figure 6 of the instant application, a structure comprising a varactor which comprises a plate region 54 and a body region 40 below and around the plate region, the body region being of a first (p) conductivity type, the plate region being of a second (n) conductivity type opposite to the first conductivity type (see paragraph 19 of the instant application), the plate and body region meeting each other to form a pn junction;

a plate electrode 56 and a body electrode 46 respectively connected to the plate and body regions, the plate electrode being at a plate-to-body bias voltage relative to the body electrode;

a dielectric 42 is over the body region and contacting it; and

Art Unit: 2891

a gate electrode 44 situated over the dielectric layer at least where the dielectric layer contacts the material of the body region, the gate electrode being at a gate-to-body bias voltage VGB relative to the body electrode. Note that applying, and varying (which is the case here) a voltage to a device, adds nothing to the structure of the device; rather it's a method of using the device.

Regarding claims 19 and 28, the plate and body regions extend to a primary surface of the semiconductor body, as can be seen in the figure.

Regarding claims 20 and 29, the plate region occupies a lateral plate area along the primary surface, the varactor has a minimum capacitance dependent on the plate area (inherent in the structure). Again, note that making an inversion layer selectively appearing and disappearing in the body region is achieved by the manipulation of the plate and the gate voltage (see the explanation above).

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 22, 31-37, 54, and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA as applied to claims rejected above under 35 U.S.C. 102(a), and further in view of the Japanese patent issued to Misu et al. (Doc. ID#:07226643).

Art Unit: 2891

Regarding claims 22, 31, 32, 34, and 35, AAPA discloses the claimed invention, as discussed above, except for the plate region having finger portions continuous with the main plate portion, extending laterally away from the main plate portion and meeting the body region there along.

The Japanese patent discloses in figures 7, 9, and 12, that unparallel conductive finger shaped contact regions in a device are interdigitized. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the finger shaped plate portions of the AAPA structure finger shaped, since it is well known in the art that this kind of configuration reduces the current density in a region of a contact area and consequently reduces undesirable effects such as heat concentration in the contact region.

Regarding claims 33, 36, 37, 54, and 62, there are at least 4 finger portions, 2 of figure 12 of the Japanese reference, which is of lesser average dimension perpendicular to that finger portion(the horizontal main portion wherein fingers 2 branch out therefrom) than is the main plate portion. Also, note that finger 18 of figure 11 has two horizontal finger portions perpendicular to the main finger 18.

6. Claims 47-52, 55-60, and 63-68 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA as applied to claims 17-21, 23-30, 47-53, 61, 69-70, above, and further in view of Litwin (US Patent 6,100,770), for claims 47-52 and 55-60, and AAPA in view of the Japanese patent and Litwin (claims 63-68).

AAPA discloses the claimed invention, as discussed above, except a circuitry in the signal path of the varactor. Litwin discloses in figure 6, there are inductors L1 and L2 to function with either of the varactors shown in the figure. See figure 6 and column 6, lines 18-67, wherein

Art Unit: 2891

there is a capacitance signal path through capacitor Cext, the plate and body electrodes of either V1 or Vn is in that path. Also, there are inductors L1 and L2 to function with either of the varactors. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the varactor of AAPA in the circuitry of the Litwin reference in order to take advantage of the variable capacitance properties of it in the circuit.

***Allowable Subject Matter***

7. Claims 38-46 and 71-122 are allowed.
8. Claims 123-130 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dana Farahani whose telephone number is (571)272-1706. The examiner can normally be reached on M-F 8:00AM - 5:00PM.

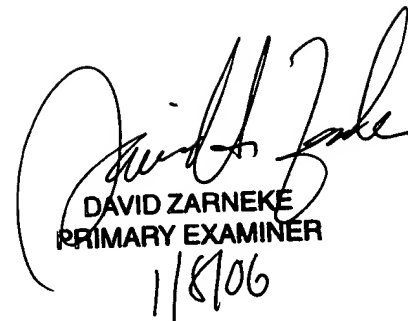
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Baumeister can be reached on (571)272-1706. The fax phone numbers for the organization where this application or proceeding is assigned are (571)273-8300 for regular and After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Application/Control Number: 09/903,059  
Art Unit: 2891

Page 6

D. Farahani

  
DAVID ZARNEKE  
PRIMARY EXAMINER  
1/8/06